

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1.-43. (canceled)

44. (currently amended) A method for producing a three-dimensional multi-material component by the ink-jet-type printing of droplets of at least one material in successive layers, comprising the steps of:

(1) cutting up a representation of the multi-material component into characteristic objects;

(2) slicing the representation of the component into print layers as a function of said characteristic objects;

(3) establishing a plurality of discrete spatial print path trajectories for each print layer;

(4) establishing a set of printing parameters as a function of the nature of the materials deposited and the deposition conditions thereof for each print layer and for each discrete spatial trajectory; and

(5) establishing a spatial and temporal sequencing law for a print path for said print layers and for said discrete spatial trajectories as a function of the objects, arranging the objects in a three-dimensional arrangement and the characteristics of the printer, in order to optimise the process of depositing each print layer,

wherein the slicing of the representation of the multi-material composite consists in maximising the quantity of materials deposited per print layer.

45. (cancelled)

46. (currently amended) A method for producing a three-dimensional multi-material component by the ink-jet-type printing of droplets of at least one material in successive layers, comprising the steps of:

cutting up a representation of the multi-material component into characteristic objects;

slicing the representation of the component into print layers as a function of said characteristic objects;

establishing a plurality of discrete spatial print path trajectories for each print layer;

establishing a set of printing parameters as a function of the nature of the materials deposited and the deposition conditions thereof for each print layer and for each discrete spatial trajectory;

establishing a spatial and temporal sequencing law for a print path for said print layers and for said discrete spatial trajectories as a function of the objects, arranging the objects in a three-dimensional arrangement and the characteristics of the printer, in order to optimise the process of depositing each print layer;~~The method according to claim 44, further comprising:~~

determining a first modulation of discrete spatial print path trajectories for each print layer;

determining at least one predetermined direction of discrete spatial print path trajectory for each print layer; and

determining a second modulation of the discrete spatial print path trajectory from a current layer to the following layer for two successive print layers of the same object, said second modulation depending on the number of constituent layers to be deposited for said object in order to optimise the cohesion of the final structure of said multi-material component.

47. (previously presented) The method according to claim 46, wherein said first modulation consists in determining a second discrete spatial trajectory by a spatial shift of the ejection step of a first discrete spatial trajectory.

48. (previously presented) The method according to claim 46, wherein said second modulation of the discrete spatial print path trajectory is a modulation of the print path direction defined for each print layer of the object relative to an orthogonal reference frame, each print layer being allocated a specific direction which differs from a preceding print layer to the following print layer of the object.

49. (previously presented) The method according to claim 46, wherein, for a successive ejection of at least one droplet of material at a predetermined ejection step, said second modulation consists of an amplitude and/or spatial shift modulation of said ejection step from a preceding print layer to the following print layer of the object.

50. (currently amended) A method for producing a three-dimensional multi-material component by the ink-jet-type printing of droplets of at least one material in successive layers, comprising the steps of:

(1) cutting up a representation of the multi-material component into characteristic objects;

(2) slicing the representation of the component into print layers as a function of said characteristic objects;

(3) establishing a plurality of discrete spatial print path trajectories for each print layer;

(4) establishing a set of printing parameters as a function of the nature of the materials deposited and the deposition conditions thereof for each print layer and for each discrete spatial trajectory; and

(5) establishing a spatial and temporal sequencing law for a print path for said print layers and for said discrete spatial trajectories as a function of the objects, arranging the objects in a three-dimensional arrangement and the characteristics of the printer, in order to optimise the process of depositing each print layer~~The method according to claim 44,~~

wherein the spatial and temporal sequencing law for print path of the print layers and the discrete spatial trajectories comprises a plurality of printing instructions and of successive cleanings of the ejection system.

51. (currently amended) A method for producing a three-dimensional multi-material component by the ink-jet-type printing of droplets of at least one material in successive layers, comprising the steps of:

(1) cutting up a representation of the multi-material component into characteristic objects;

(2) slicing the representation of the component into print layers as a function of said characteristic objects;

(3) establishing a plurality of discrete spatial print path trajectories for each print layer;

(4) establishing a set of printing parameters as a function of the nature of the materials deposited and the deposition conditions thereof for each print layer and for each discrete spatial trajectory; and

(5) establishing a spatial and temporal sequencing law for a print path for said print layers and for said discrete spatial trajectories as a function of the objects, arranging the objects in a three-dimensional arrangement and the characteristics of the printer, in order to optimise the process of depositing each print layer~~The method according to claim 44,~~

wherein one of the printing parameters is the ejection distance orthogonal to the deposition surface, said method consisting in regulating said ejection distance around nominal values, the nominal values being determined so as to optimise the deposition of the materials on the deposition surface.

52. (previously presented) The method according to claim 44, wherein one of the printing parameters is the size and shape of the ejected material droplets, said method consisting in controlling the size and the shape of each droplet of materials to be ejected, as a function of the nature of the materials, the deposition conditions thereof and predetermined print layer thicknesses.

53. (previously presented) The method according to claim 44, wherein one of the printing parameters is the temperature of the materials prior to ejection, said method consisting in controlling the temperature of these materials prior to ejection of each droplet, as a function of the nature of these materials and the type of ejection means.

54. (currently amended) A method for producing a three-dimensional multi-material component by the ink-jet-type printing of droplets of at least one material in successive layers, comprising the steps of:

(1) cutting up a representation of the multi-material component into characteristic objects;

(2) slicing the representation of the component into print layers as a function of said characteristic objects;

(3) establishing a plurality of discrete spatial print path trajectories for each print layer;

(4) establishing a set of printing parameters as a function of the nature of the materials deposited and the deposition conditions thereof for each print layer and for each discrete spatial trajectory; and

(5) establishing a spatial and temporal sequencing law for a print path for said print layers and for said discrete spatial trajectories as a function of the objects, arranging the objects in a three-dimensional arrangement and the characteristics of the printer, in order to optimise the process of depositing each print layer~~The method according to claim 44,~~

wherein one of the printing parameters is the degree of obstruction of the ejection system, said method consisting in cleaning the ejection system once the degree of obstruction exceeds a predetermined obstruction threshold value.

55. (previously presented) The method according to claim 44, wherein one of the printing parameters is the storage state of the materials, said method consisting in controlling the material state characteristics by controlling the temperature, controlling the pressure and controlling the state of dispersion of the stored materials as a function of their nature in order to optimise the material storage conditions.

56. (previously presented) The method according to claim 44, wherein one of the printing parameters is the state of the printing environment, said method consisting in controlling the characteristics of the environment in which the multi-material component is produced as a function of the nature of the deposited materials.

57. (currently amended) A method for producing a three-dimensional multi-material component by the ink-jet-type printing of droplets of at least one material in successive layers, comprising the steps of:

(1) cutting up a representation of the multi-material component into characteristic objects;

(2) slicing the representation of the component into print layers as a function of said characteristic objects;

(3) establishing a plurality of discrete spatial print path trajectories for each print layer;

(4) establishing a set of printing parameters as a function of the nature of the materials deposited and the deposition conditions thereof for each print layer and for each discrete spatial trajectory; and

(5) establishing a spatial and temporal sequencing law for a print path for said print layers and for said discrete spatial trajectories as a function of the objects, arranging the objects in a three-dimensional arrangement and the characteristics of the printer, in order to optimise the process of depositing each print layer~~The method according to claim 44,~~

wherein one of the printing parameters is the power and wavelength of a radiation applied to the deposited materials as a function of the nature of the deposited materials.

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58-86. (canceled)